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Impact of Gender Stereotype on Student's Self-Concept and Academic Performance in Science

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Abstract: The main purpose of this study was to determine the impact of gender stereotype on senior high school students' self-concept and academic performance in science. Employing a descriptive- correlational design, two sets of instruments were used. Part I asked the demographic profile of the students, and Part II gathered data on gender stereotype and student's self-concept. After satisfying the requirement of content validity and internal consistency reliability to gather the needed data from stratified randomly selected 209 Senior High School students in the Municipality of Panitanin the school year 2018-2019. In the analysis and interpretation of data descriptive were used. In the analysis of data, Statistical Package for the Social Sciences (SPSS) was used to process the data gathered, mean and standard deviation were used to describe the overall level of gender stereotype and self-concept of the respondents. The findings revealed that there is significant relationship between gender stereotype and sex, and self-concept and sex.

Keywords: Gender, Gender Stereotype, Academic Performance, Self-concept

1. Introduction

Gender is mainly used conventionally to describe how the society gives certain roles to boys and girls. According to Kauffman (2007) gender has to do with behaviors that have become associated with masculinity and femininity, and with how people see their roles as male or female. Therefore, gender is related with how individuals perceive themselves in such a way that most people of the same sex identify themselves with certain attributes. These attributes affect children as they develop.

Gender stereotypes testify individuals' orientation and past experiences, which could manifest positively or negatively as individuals interact with others within and outside their immediate environment. It is believed that stereotypic views might affect individuals' self-cognitive development, as well as their feelings, actions, and attitudes. Stereotypes are widely held beliefs about the character and behavior of all members of a group. Stereotyping is the perception, clarification, and assessment of social objects (events) on the basis of specific notion (Ramalingam, 2006). Stereotypes about gender are pervasive in most societies. These views tend to rigidly define the innate capabilities and attitudes of each sex, and social roles that are deemed appropriate for men and women. Traditional beliefs about gender roles may influence the social fabric through the school, the workplace, the family or the media, and lead to social environments where examples confirming gender stereotypes abound, while gender-inappropriate behaviors, especially on the part of women, tend to meet with social backlash or disapproval. There are many differences between men and women. To some extent, these are captured in the stereotypical images of these groups. Stereotype is about the way men and women think and behave that is widely shared, suggesting a kernel of truth. However, this study focuses not only on the existing difference, but also wanted to identify the impact with the way men and women define themselves and treated others. It also shows the nature and content of gender stereotype and considers how this is related to the gender differences, sex, and the K to 12 strand of secondary students. This study also wanted to show how gender stereotyping affect the way people attend to, interpret, and remember information about themselves and others. This study is significant because this might provide clarification about some perceptions like males "male students as lazy and troublesome and female students as diligent". Inside a regular classroom this perception could sometimes be observed as an existing phenomenon. In line with this observation, this study was conceptualized. With the purpose of producing an educational material that could somehow enlighten and encourage students about gender stereotyping at the same time improving

their self-concept, which will ultimately led to an improve performance in class, specifically, in science class. Hence, this study.

Generally, the main purpose of the study was to investigate the influence of gender stereotype on student's self-concept and academic performance on science subject.

Specifically, it sought answers to the following questions: 1. What is the level of students' awareness on gender stereotype when grouped as a whole and when classified according to age, sex, and K to 12 strands. 2. What is the level of self-concept of students when grouped as a whole and when classified according to age, sex, and K to 12 strands. 3. Is there a significant difference in the gender stereotype of senior high school students when classified according to age, sex and K to 12 strands. 4. Is there a significant difference in the self-concept of senior high school students when classified according to: age, sex and K to 12 strand 5. Is there a significant relationship between gender stereotypes and academic performance? 6. Is there a significant relationship between self-concept and academic performance? 7. Is there a significant relationship between gender stereotypes and Self-Concept? 8. What science output can be produced out of this study?.

2. Methodology

This study utilized a descriptive-correlational research design. A descriptive design seeks to describe the current states of a variable or phenomenon while correlational design explores the relationship between variables (Creswell, 2013).

This study wanted to describe the senior high school students' level of gender stereotype and level of self-concept. At the same time, this study wanted to find out if relationships exist among students' level of gender stereotype, academic performance in science and self-concept.

This study was conducted at a secondary school in Panitan, Capiz, in the academic year 2018-2019.

The respondents of the study were the senior high school students of a secondary school at Panitan, Capiz, who were officially enrolled, during first semester of A.Y 2018-2019. Table below shows the distribution of respondents and their corresponding frequencies. The number of sample size was determined using the Cochran's formula. The researchers used stratified random sampling in determining the quota of population.

The two researcher-made instruments were used in the gathering of information or data. Part 1 contained the demographic profile of the students such as their age, sex, and K to 12 strand. Part 2 of the instrument gathered data on the gender stereotype and self-concept. For the gender stereotype, the construction of items, as statements on this instrument was based on the dominant stereotyping that is existing inside the classroom. On the other hand, statements under self-concept were revised and constructed based on the other researches.

The two categories of the questionnaire passed the reliability test, the self-concept with $\alpha = .86$ while gender stereotype $\alpha = .88$. These values indicate that the instrument is reliable and ready for actual conduct of the study.

Table 1: Respondents of the study.

K to 12 STRAND	POPULATION (N)	SAMPLE SIZE(n)
HUMMS	139	63
STEM	66	31
ABM	110	50
TVL	104	47
CSS	40	18
TOTAL	459	209

3. Findings and Discussions

3.1 Level of Students' Awareness on Gender Stereotype

The level of awareness of gender stereotype of senior high school students, can be noted that the respondents are slightly aware ($M= 3.44$, $SD= .33$) when asked about gender stereotyping. This implies that students have very little idea of what gender stereotyping is. They may be experiencing gender stereotyping but probably they don't find importance on it that is why somehow, they simply disregard its occurrence.

Table 2: Level of gender stereotype according to age

AGE	M	SD	VERBAL INTERPRETATION
16-17	3.44	.35	Slightly aware
18-19	3.47	.28	Slightly aware
20-above	3.23	.16	Slightly aware
GRAND MEAN	3.44		SLIGHTLY AWARE

Note: Verbal Interpretation is based on the following scale: Fully Not Aware (1.00-1.49), Not Aware (1.50-02.49), Slightly Aware (02.50-3.49), Aware (3.50-4.49), and Highly Aware (4.50-5.0)

3.2 Level of Gender Stereotype according to Sex

Table 2.b show the level of gender stereotype when grouped according to sex, both males and females are only slightly aware of the occurrence of gender stereotyping inside their classrooms, However, it can be further noted that in terms of their means, males (M=3.52, SD=.36) have higher mean compared with that of the girls (M=3.14, SD=.32). The result of this study conforms to the study of Allan and Smith (2011) entitled, “The Influence of Sexuality Stereotypes on Men’s Experience of Gender-Role Incongruence”, reported that women are relatively unaffected by the gender and sexuality manipulations. Moreover’ Bornes (2017) stated that the more than can be done to make people aware of their biases and stereotypes, and the earlier this education occurs, the greater the likelihood of success. If people are still in school, ultimately this knowledge of biases and stereotypes and how they can overcome it will be carried out in their workplace.

Table 3: Level of gender stereotype according to sex

SEX	M	SD	VERBAL INTERPRETATION
Male	3.52	.36	Aware
Female	3.14	.32	Slightly Aware
GRAND MEAN	3.44	.33	SLIGHTLY AWARE

Note: Verbal Interpretation is based on the following scale: Fully Not Aware (1.00-1.49), Not Aware (1.50-02.49), Slightly Aware (02.50-3.49), Aware (3.50-4.49), and Highly Aware (4.50-5.0)

3.3 Level of Gender Stereotype according to K to 12 Strand

When classified according to K to12 strand, it can be noted that senior high school students are only slightly aware about gender stereotyping. This implies that with regards to their strand, HUMMS in the academic track got the highest mean (M= 3.46, SD=.37) followed by STEM (M= 3.43, SD=.31), TVL (M= 3.40, SD=.28), ABM (M= 3.37, SD=.29) and CSS in the TVL track got the lowest mean (M=3.36, SD=.23). This means that their awareness of gender stereotyping inside their classroom is limited. Temple (2005), conducted a study that examines the possible presence of gender queer issues on textbooks. It was noted that despite the presence of same sex issues, same-sex sexuality in the textbooks was only limited to homosexuality that fall into queerness were hardly evident.

United Nations Educational, Scientific and Cultural Organization account on the new approaches in studying gender representations claims that the characters in textbooks, who have assigned skills, roles, statutes, ways of acting and attributes.

Table 4: Level of gender stereotype according to K to 12 strand

K to12 STRAND	M	SD	VERBAL INTERPRETATION
1-HUMMS	3.46	.37	Slightly Aware
2-STEM	3.43	.31	Slightly Aware
3-ABM	3.37	.29	Slightly Aware
4-TVL	3.40	.28	Slightly Aware
5-CSS	3.36	.23	Slightly Aware
GRAND MEAN	3.40	.30	SLIGHTLY AWARE

Note: Verbal Interpretation is based on the following scale: Fully Not Aware (1.00-1.49), Not Aware (1.50-02.49), Slightly Aware (02.50-3.49), Aware (3.50-4.49), and Highly Aware (4.50-5.0)

3.4 The Level of Students’ Self-Concept in Science

The level of self-concept when grouped as a whole can be noted that the students have average self-concept (M= 3.40; SD=.30). The result reveals that the students have little awareness about their self-concept especially on their Science subject as a Whole. The result of this study can be interpreted as students having a minimal self-confidence and believe that he/she will only accomplish on a little basis.

3.5 Level of Self-Concept according to Age

Table 3 shows the level of self-concept when classified according to age, it can be noted that the ages between 16-17 years old got the highest mean ($M= 3.41$, $SD=.31$) on the other hand, ages between 20-above years old got the lowest mean ($M= 3.39$, $SD=.41$). This implies that respondents have an average self-concept when asked according to their age. It means that students have a minimal self-confidence and believe that he will only accomplish in a little basis.

Bloom (2006) stated that similarities in self-concept with age outweigh differences. A curvilinear relationship was found between chronological age and self-concept supporting both the theories of life stages and time. Further, Bloom (2006) stated that self-concept increases from 20's until 40 – 49-year period. After which, there was a downward turn wherein older persons incorporate certain of positive stereotypes of aging and their self-concepts. Considering the ages of the respondents, this may be the time where their knowledge on self-concept maybe on its developing stage that requires being enhanced with the help of parents, teachers and others whom they are always associated with.

Table 5: Level of self-concept according to age

AGE	M	SD	VERBAL INTERPRETATION
16-17	3.41	.31	Average Self-Concept
18-19	3.40	.26	Average Self-Concept
20-above	3.19	.41	Average Self-Concept
GRAND MEAN	3.40	.30	AVERAGE SELF-CONCEPT

Note: Verbal Interpretation is based on the following scale: Very Low Self-concept (1.00-1.49), Low Self-concept (1.50-02.49), Average Self-concept (2.50-3.49), Moderately High Self-concept (3.50-4.49), and High Self-concept (4.50-5.0)

3.6 Level of Self-Concept according to Sex

When classified according to sex, it can be noted that male have the highest mean ($M= 3.43$, $SD=.31$) while female have only ($M= 3.40$ $SD=.30$). This mean that male and female have minimal self-esteem and believe that he will achieve on a low basis.

Block and Robins (cited by Rafei, 2008) stated that adolescents females' self-esteem is oriented interpersonally while males' self-esteem is more self-oriented. Bloom (2006) stated that similarities in self-perception with age outweigh differences. Moreover' Bornes (2017) stated that the more than can be done to make people aware of their self-concept, and the earlier this education occurs, the greater the likelihood of success. If people are still in school, ultimately this knowledge of self- concept and how they can overcome it will be carried out in their workplace.

Table 6: Level of self-concept according to sex

SEX	M	SD	VERBAL INTERPRETATION
Male	3.43	.31	Average Self-Concept
Female	3.40	.30	Average Self-Concept
GRAND MEAN	3.40	.30	AVERAGE SELF-CONCEPT

Note: Verbal Interpretation is based on the following scale: Very Low Self-concept (1.00-1.49), Low Self-concept (1.50-02.49), Average Self-concept (2.50-3.49), Moderately High Self-concept (3.50-4.49), High Self-concept (4.50-5.0)

3.7 Level of Self-Concept according to K to 12 Strand

Table 3.c show the level of self-concept when classified K to 12 strands, generally, it can be noted that HUMMS has the highest mean ($M= 3.44$, $SD=.37$) followed by STEM ($M= 3.43$, $SD=.31$), TVL ($M= 3.40$, $SD=.28$), ABM ($M= 3.37$, $SD=.29$) on the other hand, CSS has the lowest mean ($M= 3.36$, $SD=.23$). This means, that senior high school students have average self-concept which was interpreted as students having a minimal self-confidence and that they believe that they could only achieve or accomplish things to do on a little basis only ($M=3.40$, $SD=.30$).

Table 7: Level of self-concept according to K to 12 strands

K to 12 STRAND	M	SD	VERBAL INTERPRETATION
1-HUMMS	3.44	.37	Average Self-Concept
2-STEM	3.43	.31	Average Self-Concept
3-ABM	3.37	.29	Average Self-Concept
4-TVL	3.40	.28	Average Self-Concept
5-CSS	3.36	.23	Average Self-Concept
GRAND MEAN	3.40	.30	AVERAGE SELF-CONCEPT

Note: Verbal Interpretation is based on the following scale: Very Low Self-concept (1.00-1.49), Low Self-concept (1.50-02.49), Average Self-concept (2.50-3.49), Moderately High Self-concept (3.50-4.49), High Self-concept (4.50-5.0)

The result of this study, further revealed that there is a need to improve students' self-concept regardless of their K to 12 strands. As stated by Anitha and Parameswari (2017), as per the general principle in education, a student needs good academic self-concept in order to be successful academically.

Siguan (cited in Sonsona, 2012) stated that self-concept was also found significant on the choice of specialization of students.

3.8 Significant Difference in the Gender Stereotype of Senior High School Students when Classified according to Sex

Table 4 below shows that there is a significant difference in the gender stereotype of students when classified according to sex ($t= 2.010$, $p=.046 \leq .05$). This means that the level of gender stereotype of males is significantly different from the level of gender stereotype of females because most of males are aware about gender stereotype than their female counterparts.

Stated by Siegel K, Meanier E. (2018), that traditional stereotype about sex and gender presents men as assertive, aggressive, sexually adventurous, and emotionally restrained, and women as docile, passive sexually modest, and emotionally sensitive. Past researchers shows that such stereotypes imposed constraints on heterosexual relationship that decrease sexual satisfaction for men and women.

3.9 Significant Difference in the Gender Stereotype of Senior High School Students when Classified according to Age and K to 12 Strand

Data below shows that there is no significant difference in the gender stereotype of students when classified according to age ($t= 1.000$, $p=.370 \geq .05$). This means that the level of gender stereotype of students do not differ in contrasting in terms of age of senior high school students.

Jaiswal and Chudhouri (2017) compared normal adolescents from antisocial adolescents in terms of their self-concept. They stated that there were no differences between normal students in age group 12-18 years of age in self-concept. They concluded that self-concept was stable overtime in the adolescent period.

And also there is no significant difference in the gender stereotype of students when classified according to strand ($t=.540$, $p=.706$). According to Voyer (2018) Results show that gender stereotypes are common among STEM students, especially in women. Self-efficacy perception is negatively correlated to female students' belief that STEM courses and careers are better suited for men.

The researchers concluded that negative effects, not only students' academic performance, but also their self-efficacy perception towards STEM courses. The gender stereotypes among female students may lead to STEM career avoidance, because of the decrease in their self-efficacy perception toward STEM learning.

3.10 Significant Difference in the Self-concept of Senior High School Students when Classified according to Sex

Data below shows that there is a significant difference in the self-concept of students when classified according to sex ($t= 1.631$, $p=.203$). On the other hand, Muthuri (2017) found no statistically significantly relationship between sex and the different dimensions of self-concept. However, male were found to have a higher overall self-concept than female undergraduate students.

There are tentative indicators from the current study that self-concept can be improved through campus based programs aimed at increasing positive self-concept among students.

3.11 Significant Difference in the Self-concept of Senior High School Students when Classified according to Age and K to 12 Strand

Data below shows that there was no significant difference in the gender stereotype of students when classified according to age ($t= 1.000$, $p=.310$). This simply shows similarity on the level of self-concept regardless of their age.

The result of his study is in conformity with the study of Jaiswal and Chudhuri (2017) which stated that there were no differences between adolescents in age group 12 – 18 years of age in self-concept. They, therefore, concluded that self-concept was stable overtime in the adolescent period.

It also shows that there is no significant difference in self-concept of senior high school students in terms of their K to 12 strand ($t=.540$, $p=.706$). This shows that in spite of their difference in the K to 12 strands, students level of self-concept are just the same. It means that self-concept does not differ in their K to 12 strands.

This is in consonance with the study of Eubank (cited by Campbell, 2007) reported a study with fourth and sixth grade children in which no significant differences were between the means of intelligence and achievement scores for high and low self-concept groups.

Likewise, this study showed that students from the STEM group, who are expected to have higher intelligence compared to other groups, did not significantly differ in terms of their level of self-concept from students in the other strand in the K to 12 senior high school curricula.

Tables 8: Significant Difference between gender stereotype to age, sex and K to 12 strands; and significant difference between self-concept to age, sex and K to 12 strands.

VARIABLE	STATISTICAL TOOL	T-VALUE	SIG. (2tailed)
Sex Gender Stereotype	t-test	2.010	.46
Age K to 12 strand	ANOVA	1.000 .540	.370 .706
Sex Self-concept	t-test	1.631	.203
Age K to 12 strand	ANOVA	1.000 .540	.370 .706

3.12 Significant Relationship between Gender Stereotype and Academic Performance to Self-Concept

Table 8 shows that there is a very high significant relationship but weak correlation between gender stereotype and academic performance ($r=.216$, $p=.002$). This means that the gender stereotyping that is happening inside the classroom

have low impact on the academic performance of senior high school students in science. But considering the positive linear correlation between gender stereotype and academic performance, the researchers consider that probably by improving the students' knowledge on gender stereotyping might have a considerable positive effects on student's academic performance. The results of this study validates the work of Alan (2018) who studied the effect of elementary school teacher's beliefs about gender roles in student achievement. Results showed that students who were taught for longer than a year by teachers with traditional gender views have lower academic performance, specifically on objective math and verbal tests, and this effect is amplified with longer exposure to the same teacher.

And also, there is a significant relationship and very slight effect between self-concept and academic performance ($r=.140$, $p=.043$). This means that the students with high assurance on himself there is a possibility of high academic performance. Furthermore the weaker the self-concept, the weaker the academic performance. Laryen, et.al (2014), determines the influence of students' self-concept on their academic performance. They concluded that self-concept was perceived positively by students; however, this self-concept does not directly predict students' academic performance. Further, Laryen, et.al (2014) recommended that teachers, parents and other stakeholders should see it as a duty to consider this self-concept of students since they influence the development of positive self-concept among students when dealing or interacting with them. Also, they must help, motivate, and supervise students.

Moreover, there is a significant relationship between gender stereotype and self-concept with a moderate positive linear relationship ($r = .507$, $p=.0000$,). A positive correlation exists when one variable decreases as the other variable decreases, or one variable increase while the other also increases (Hayes, 2019). Therefore, in this study, it can be implied that increasing students' awareness on gender stereotyping would also increase their level of self-concept.

In connection to this, American Association of University Women (2006) argued that different treatment given by teachers and the society dangerously hampered the educational progress, self-esteem and career choices. If this is so, there are indicators that self-concept of students could be affected by stereotyping.

4. CONCLUSIONS

Based on the findings of the study, Senior high school students, at this point of their age, despite of their differences in sex and K to 12 strands, students are not very conscious about gender stereotyping happening around them. They may have experienced or observed gender stereotyping inside the classroom, however, they do not find importance on it that is why they simply disregard its occurrence. The students are on the developing stage of self-confidence. This denotes that when students are trying to do something on their own, they may have experienced some hesitation about the quality of the work that they can produce. Senior high school students having a low self-concept might be a result of other external factors, like their family matters, that permeate their activities in school. Gender stereotype do not vary with regards to their age and k to 12 strands. Furthermore, this simply means that gender stereotyping might not affect the respondent's age and chosen k to 12 strands. In terms of the respondent's self-concept they have the same level of self-confidence with regards to their age and chosen K to 12 strands. Moreover, Senior high school student's self-concept maybe needs to be developed that requires enhancement with the help of their peers, parents and teachers or to the people where they are always associated. Gender stereotyping inside the classroom somehow affects the academic performance of the senior high school students. Therefore, continuous improvement in students' self-concept, might also improve students' academic performance in science. Self-concept may exert a degree of influence on the academic performance of senior high school students in their science subject. Such that increasing the level of students' self-concept would somehow increase students' academic performance. Gender stereotype and self-concept revealed awareness on gender stereotype could influence students' level of self-concept. This means that increasing the senior high school students' awareness on gender stereotype could also increase the level of their self-concept.

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